earth." Mathematical formulæ, concerned with the foregoing discussions, are appended to the Address.

In the same volume Dr. E. Hull gives a clear statement of his views as to the occurrence of Laurentian beds in Donegal and elsewhere in Ireland, and a paper on the metamorphic rocks and minerals of Sligo and Leitrim, with analyses by Mr. E. T. Hardman. Mr. G. A. Kinahan supplies very interesting papers on the gold of Ireland and the geological structure of Bray Head. Mr. G. H. Kinahan explains why some palæozoic rocks in Galway and elsewhere cannot be regarded as Laurentian; and supplies a short but valuable illustrated note on some moraines on Mount Leinster, in counties Wicklow and Carlow. Prof. V. Ball gives a catalogue of the meteorites, of which there are specimens in the museums of Dublin, and includes the published analyses of four meteorites known to have fallen in Ireland.

The geologists of Glasgow, like those of Ireland, have brought down their published work to 1882; but, beginning with 1880, they make a thicker volume for this issue. It is richer in palæontological researches than the Irish Journal, on account of the great opportunities for collecting fossils, both from the varied Carboniferous deposits of Lanarkshire and neighbourhood and from the Post-tertiary beds of the Clyde valley. Of these last, as exposed in the dock of Garvel Park, at Greenock, Mr. D. Robertson gives a full account, with long lists of the fossils obtained. Graptolites and other fossils from Dumfriesshire are treated of by Mr. J. Dairon. The palæontology of Lesmahagow, Silurian and Carboniferous, is studied by Dr. J. R. S. Hunter, and some fossiliferous beds in the Beith and Daldry district by Mr. Robert Craig. Some fish-remains from East Kilbride are noted by Mr. James Coutts; Mr. John Young discriminates some Carboniferous *Fenestellæ*; and Mr. W. E. Koch gives an interesting note on Mull and its leaf-beds.

There are several good memoirs also on local geology (Muirkirk, Isle of Man, Renfrewshire, Shetland, &c.), and on boulders, limestones, and igneous rocks; also on the bismuth and tin deposits of Australia. Several of these papers are illustrated with plates.

Neither last nor least in this new volume of the 'Transactions' is an excellent account of the "Origin and Early History of the Geological Society of Glasgow" by Mr. T. M. Barr, who writes carefully and enthusiastically, and has much real pleasure in showing that good work has been done by the members, and that the society may fairly claim to have made its mark on the progress of geological science.

MISCELLANEOUS.

A proposed new 'Nomenclator Palæontologicus.'

We have received a printed report on the subject of a new 'Nomenclator Palæontologicus,' prepared by Dr. M. Neumayr, of

Vienna, to be submitted to a meeting of the Nomenclature Committee of the International Geological Congress which will be held at Zurich on the 7th of August. As Bronn's 'Nomenclator' dates back to the year 1858, and nothing of the kind has since been attempted, we can only hope that Dr. Neumayr's proposal may be carried out on the scale and with the completeness suggested in his admirable report.

He commences by discussing the plans adopted in the only two works which more or less occupy the ground, namely the above-mentioned 'Nomenclator' of Bronn and d'Orbigny's 'Prodrome,' both of which are of old date. The plan of the latter, as he very justly points out, renders it far more useful to the stratigraphist than to the palæontologist—that is to say, regarding it from the nomenclatorical point of view; for of course, as indicated by Dr. Neumayr, the 'Prodrome' must always be consulted by the palæontologist on account of the many new genera and species established in it.

Bronn's plan, on the contrary, was purely palæontological; stratigraphical considerations had no influence whatever upon the general arrangement of his work. In the 'Nomenclator' properly so called, which occupies his first two volumes, he has given a purely alphabetical list of all the names existing in palæontology up to his date (*i. e.* the generic names are arranged alphabetically and the specific names also alphabetically under each genus), with indications of synonymy and references to the works in which the different forms are described; while the so-called "Enumerator," constituting the third volume, forms a complete classified index to the preceding portion, and at the same time furnishes indications of the stratigraphical distribution of the species by means of a series of vertical columns. Of course in five-and-twenty years palæontology has enormously outgrown this work of Bronn's; but every one who has had any thing to do with palæontological work must own that he owes a deep debt of gratitude to the man who undertook and so successfully carried out a work of such labour and research.

"Bronn's plan of an alphabetical enumeration," says Dr. Neumayr, "has the great advantage that no terminal index is necessary, that doubts as to the arrangement of different forms never stand in the way, and finally that in those cases in which formerly species belonging to different types of the animal kingdom were thrown together under the same generic name, no complication arises from this confusion. But great as these advantages may be, it is impossible not to see that still more important considerations are in favour of systematic separation in accordance with the great primary groups of the animal and vegetable kingdoms: in the first place, in palæontological researches one usually has to do only with representatives of one of the primary divisions at a time; and then we need only make use of the volume relating to it, and not of the whole book; so that a simplification of the work is introduced. Above all, however, we must be governed by practical considerations as to the mode of bringing out the work. If every thing is to be brought into

alphabetical sequence, the printing cannot be commenced until all the manuscripts are ready, which will cause great delay in its appearance; by the arrangement under the principal types, on the contrary, the printing of any volume can begin as soon as the manuscript for it is in hand. In the one case the neglect of a single contributor will delay the appearance of the whole book, in the other case only that of a single volume. The difficulties which may arise from genera of doubtful position may be got over by cross references. That the addition of an 'Enumerator' is very desirable need hardly be indicated."

While we cannot help feeling that Bronn's plan, pure and simple, is absolutely the best, especially in view of the second advantage belonging to it, which Dr. Neumayr has pointed out, with relation to genera containing species which later researches have proved to belong to different primary divisions of the animal kingdom, and indeed with relation to doubtful organisms of all kinds, we cannot, on the other hand, deny the force of his arguments in favour of the division of the 'Nomenclator' in accordance with the great groups of the animal and vegetable kingdoms, more especially when we look at the formidable dimensions which he considers the new work will attain. He proposes to divide it into twelve volumes, as follows:—

Vol. I. Cryptogamia.	Vol. VII. Mollusca.
II. Phanerogamia.	VIII. Arthropoda.
III. Protozoa.	IX. Vertebrata.
IV. Cœlenterata.	X. & XI. Enumerator.
V. Echinodermata.	XII. Index.
VI. Vermes and Molluscoida.	

It seems to us that, supposing the suggested arrangement to be carried out as above, the usefulness of the work will very much depend upon the completeness of the index, which ought to furnish a guide to every employment of a name (generic or specific) in any part of the book, and in the case of specific names to indicate in every case the genus under which the species has been placed in each particular instance. With such an index as this nearly all the advantages of Bronn's plan will be again realized.

Dr. Neumayr further enters upon a statement of the principles on which he proposes that the work should be carried out, which seem to us to be exceedingly well conceived. Two points are especially deserving of approval, namely:—1. The regulation that no changes of names shall be made in the 'Nomenclator;' and 2, the proposal to avoid as much as possible all conventional signs, and to adopt a system of abbreviations in the citations such as will be at once intelligible to every one "who possesses some knowledge of literature," a course which we hope may lead to the suppression of that most vicious system of quoting from separate copies of papers without any reference to the periodical works in which they occur, which now prevails to a very serious extent. Dr. Neumayr's remark as to people possessing "some" knowledge of literature would

seem to indicate that he is alive to the inconveniences of this practice; and his selection of the Royal Society's List of Scientific Papers as a model points in the same direction. We can only say that we hope his proposals may be carried out upon, or nearly upon, the lines indicated in his report; in this case he and his *collaborateurs* will richly merit the thanks of all palæontologists. *Under favourable circumstances* he thinks the first volume might appear in from two to three years, and the whole be finished in from eight to ten years!

Selenotropism in Plants. By M. C. Musset.

Being struck with the influence exerted by light of very little intensity upon the so-called *heliotropic* movements of plants, the author, in order to vary the experiments, adopted the reflected light of the moon as his sole illumination. He sowed in pots seeds of plants well known for their phototropic sensibility, such as *Lens esculenta*, Mönch, *Ervum lens*, Linn., *Vicia sativa*, Linn., &c. When the young plants were a few centimetres long he placed them in a very dark place, where they remained until the night of the experiment. The stems became slender, long, and white; the leaves, which were but little developed, alone had a slightly yellow tinge. During the night of 23–24th February, with a very clear sky, these seedlings were placed in a large window looking to the south, so that they received the direct light of the moon from 9 P.M. to 3 A.M. After a very few minutes of exposure the stems became bent, with the concavity and the terminal bud always presented to the moon, and following it in its course; only about 2 A.M., owing to the changed position of the moon, the bow became nearly straight. The seedlings were then carried to another window looking westward; and a new influence was produced, and continued until the moment of the disappearance of the moon behind the mountain. After a pause of a few minutes the stems then erected themselves more or less under the influence of internal causes and geotropism. To these movements, which he observed for three successive nights, the author gives the name of *selenotropism.*—*Comptes Rendus*, March 5, 1883, p. 663.

*Jumping Seeds and Galls**. By Charles V. Riley.

Having recently received some fresh specimens of so-called "Mexican Jumping Seeds," or "Devil's Beans," as they are popularly called, I take occasion while yet they are active to exhibit them to the society. It will be noticed that these seeds are somewhat triangular, or of the shape of convolvulus-seeds, there being two flat sides meeting at an obtuse angle, and a convex one, which has a median carina. They not only roll from one side to another, but

* Read before the Biological Society of Washington, November 24, 1882.